

# COMPRESSING ANALYSIS TIMES IN HIGHLY DIVERSE COMPUTATIONAL ENVIRONMENTS

**T. D. Blacker<sup>a</sup>, B. W. Hanks<sup>a</sup>, J.F. Shepherd<sup>a</sup> and R. Leland<sup>a</sup>**

<sup>a</sup>Modeling Sciences Department 9226  
Sandia National Laboratories  
Albuquerque, NM 87111-0847  
tdblack@sandia.gov  
bwhanks@sandia.gov  
jfsheph@sandia.gov  
leland@sandia.gov

The task of significantly reducing or compressing analysis cycle times is directly dependent on the nature and scope of the analysis environment. The diversification constraints of the environment dictate the success of requisite process and data definitions, handling strategies, integration possibilities and implementation impact. For example, if the environment is limited to a specific geometry and specific analysis type, automation efforts can be reasonably narrow and deep. Conversely, if there is relatively no constraint on geometry sources, integration with various CAD systems becomes an ominous task. This presentation will analyze the spectrum of constraints starting with the specific and ending with the broadly general environments.

Homogenous, clearly delineated processes are amenable to simpler interfaces and data integration and manipulation. These systems, referred to as “vertically integrated”, are often touted as significant successes in the drive to reduce the time and push the analysis process upstream in the design cycle. Although the initial setup of these systems is expertise-intensive and may require significant technology investments, the practitioners with far less training and expertise often can successfully navigate the system. The positive impact of such systems is dependent on repetitions and quantity of similar analyses.

Environments dominated by the need for generality and flexibility are subject to a different set of constraints. Although the expertise level in a specific regime may not be as intense, the need to provide for arbitrary geometric and analysis directions complicates the integration and streamlining efforts. Interfaces need to be generic in nature and data sharing must be designed to allow minimally necessary integration without extension of the entire data structure.

Mechanisms to provide a structure that can meet the needs of the vertically integrated as well as the broad-based general environment will be discussed with emphasis on reducing time constraints while minimizing the development load on such endeavors.

## References

[1] L. Sauer, R. Clay, C. Adams, H. Walther, B. Allan, R. Mariano, C. Poore, B. Whiteside, B. Boughton, J. Dike, E. Hoffman, R. Hogan, C. LeGall, “SIENA Customer Problem Statement And Requirements”, Sandia National Laboratories, SAND2000-8255, August 2000.